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EXAMINER

STAICOVICI, STEFAN

ART UNIT PAPER NUMBER

1732

DATE MAILED: 05/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/886,107

Applicant(s)

CRANE ET AL.

Examiner

Stefan Staicovici

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11,21,22,29 and 38 is/are pending in the application.
- 4a) Of the above claim(s) 10,11,21,22,29,38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-11,21,22,29 and 38 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-9, drawn to a molding process, classified in class 264, subclass 511.
 - II. Claims 10-11, drawn to a soft tool, classified in class 425, subclass 389.
 - III. Claims 21-22 and 29, drawn to an injector tool, classified in class 425, subclass 129.1.
 - IV. Claim 38, drawn to a molding system, classified in class 425, subclass 546.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions Group I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process such as wrapping a plurality of resin pre-impregnated fiber layers in a bag, drawing a vacuum onto said bag, placing the soft tool over the wrapped vacuumed bag to form a double bag and injecting a heated fluid under pressure to cure the resin.

3. Inventions Group I and III are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the

apparatus as claimed can be used to practice another and materially different process such as injecting under pressure a pure resin into a mold cavity or wrapping a plurality of resin pre-impregnated fiber layers in a bag, drawing a vacuum onto said bag, placing the soft tool over the wrapped vacuumed bag to form a double bag and *injecting* a heated fluid under pressure to cure the resin.

4. Inventions Group I and IV are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process such as injecting under pressure a pure resin into a mold cavity or wrapping a plurality of resin pre-impregnated fiber layers in a bag, drawing a vacuum onto said bag, placing the soft tool over the wrapped vacuumed bag to form a double bag and *injecting* a heated fluid under pressure to cure the resin.

5. Inventions Group II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention of Group II has separate utility such as injecting under pressure a pure resin into a mold cavity or wrapping a plurality of resin pre-impregnated fiber layers in a bag, drawing a vacuum onto said bag, placing the soft tool over the wrapped vacuumed bag to form a double bag and *injecting* a heated fluid under pressure to cure the resin. See MPEP § 806.05(d).

6. Inventions Group II and IV are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require a soft mold tool with flexible sidewalls. The subcombination has separate utility such as in a double bag molding process that injects a heated fluid under pressure between the two bags to cure the resin.

7. Inventions Group III and IV are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because combination does not require a fastener disposed at the outlet of the chamber. The subcombination has separate utility such as in an injection molding process in which resin is injected into a mold cavity formed by two rigid mold halves.

8. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

9. During a telephone conversation with Mr. Kendrew H. Colton on May 23, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-9.

Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-11, 21-22, 29 and 38 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

10. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

11. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: "Method of Resin Transfer Molding."

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1 and 3-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Han *et al.* (US Patent No. 5,939,013).

Han *et al.* ('013) teach the claimed molding process including, providing a mold (23), placing a plurality of dry fiber layers (27) onto said mold (23), sealing a resin, impervious vacuum bag (37) to the mold (23) using seal (39) to form a vacuum enclosure defined by a vacuum channel (49) along the periphery of the mold (see col. 6, line 66 through col. 7, line 2), applying a vacuum through vacuum port (45), injecting a resin through injection port (43) and curing the resin (see col. 3, line 62 through col. 4, line 11 and Figures 2 and 5).

Regarding claim 3, Han *et al.* ('013) teach one or more fiberglass layers (col. 4, lines 52 and 58).

In regard to claim 4, Han *et al.* ('013) teach placing stiffeners (31) (support members) onto mold (23) and fiber layers (27) prior to sealing the resin, impervious vacuum bag (37) to the mold (23) (see col. 4, lines 63-67 and, Figures 2 and 5).

Specifically regarding claim 5, Han *et al.* ('013) teach injecting a resin through a single injection port (43) (Figures 1 and 2).

Regarding claim 6, Han *et al.* ('013) teach plural injection ports (see col. 6, lines 56-57).

In regard to claims 7-8, Han *et al.* ('013) teach a mold having a vacuum channel (49) along the periphery of the mold (see col. 6, line 66 through col. 7, line 2 and Figure 5). Further, Han *et al.* ('013) teach that the injection port (43) is spaced inwardly from the vacuum ports (45) (see Figures 1 and 2).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alanko (US Patent No. 5,665,301) in view of Han *et al.* (US Patent No. 5,939,013).

Alanko ('301) teaches the basic claimed molding process including, providing a mold (1), placing a plurality of dry fiber layers (4) onto said mold (1), sealing a resin, impervious vacuum bag (3) to the mold (1) using inner and outer seals (6, 7) to form a vacuum enclosure defined by a vacuum channel (8) and vacuum conduits (11) that communicate with the vacuum channel (8) and the plurality of dry fiber layers (4) along the periphery of the mold, applying a vacuum through vacuum port (10), injecting a resin through injection port (9) and curing the (see col. 2, line 66 through col. 3, line 66 and Figures 1 and 2).

Regarding claim 1, although Alanko ('301) teaches a general fiber reinforcement (4), Alanko ('301) does not specifically teach fiberglass reinforcement. Han *et al.* ('013) teach a molding process including, providing a mold (23), placing a plurality of dry fiberglass layers (27) onto said mold (23), sealing a resin, impervious vacuum bag (37) to the mold (23) using seal (39) to form a vacuum enclosure defined by a vacuum channel (49) along the periphery of the mold (see col. 6, line 66 through col. 7, line 2), applying a vacuum through vacuum port (45), injecting a resin through injection port (43) and curing the resin (see col. 3, line 62 through col.

4, line 11 and Figures 2 and 5). Therefore, it would have been obvious for one of ordinary skill in the art to have used a fiber glass fibrous reinforcement as taught by Han *et al.* ('013) in the process of Alanko ('301) because Alanko ('301) teaches a general fiber reinforcement whereas Han *et al.* ('013) teach that fiberglass reinforcement is a typical fibrous reinforcement that is sufficiently flexible to conform to the mold surface and also because both references teach similar vacuum assisted resin transfer molding processes.

In regard to claim 2, Alanko ('301) teaches coating the mold surface (1) with a gel coat (see col. 10, lines 30-32).

Specifically regarding claim 3, Alanko ('301) teaches a reinforcement bundle (4). It is submitted that a "bundle" includes a plurality of layers.

Regarding claim 4, Alanko ('301) teaches placing a core structure (support members) onto the reinforcement bundle (4) (see col. 10, lines 33-35). Han *et al.* ('013) teach placing stiffeners (31) (support members) onto mold (23) and fiber layers (27) prior to sealing the resin, impervious vacuum bag (37) to the mold (23) (see col. 4, lines 63-67 and, Figures 2 and 5). Therefore, it would have been obvious for one of ordinary skill in the art to have provided stiffeners (support members) as taught by Han *et al.* ('013) in the process of Alanko ('301) because, Han *et al.* ('013) specifically teaches that such stiffeners (support members) provide for a uniform resin distribution and especially increase strength and stiffness of the resulting molded product (see col. 8, lines 12-16), hence providing for an improved molded product and also because both references teach similar vacuum assisted resin transfer molding processes.

In regard to claims 5 and 6, Alanko ('301) teach one or more injection ports (9) (see col. 2, lines 45-48 and Figures 1 and 2).

Specifically regarding claims 7-9, Alanko ('301) teach a mold having a vacuum channel (8) formed along the periphery of the mold. Further, Han *et al.* ('013) teach that the injection port (9) is spaced inwardly from the vacuum port (10) (see Figures 1 and 2). Furthermore, Alanko ('301) teach vacuum conduits (11) that communicate with the vacuum channel (8) and the plurality of dry fiber layers (4) along the periphery of the mold (see col. 2, line 66 through col. 3, line 66, col. 5, lines 36-61 and Figures 1 and 2).

16. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Han *et al.* (US Patent No. 5,939,013) in view of Alanko (US Patent No. 5,665,301).

Han *et al.* ('013) teach the basic claimed process as described above.

Regarding claim 2, Han *et al.* ('013) does not teach applying gel coat to the mold surface. Alanko ('301) teaches the basic claimed molding process including, providing a mold (1), placing a plurality of dry fiber layers (4) onto said mold (1), sealing a resin, impervious vacuum bag (3) to the mold (1) using inner and outer seals (6, 7) to form a vacuum enclosure defined by a vacuum channel (8) and vacuum conduits (11) that communicate with the vacuum channel (8) and the plurality of dry fiber layers (4) along the periphery of the mold, applying a vacuum through vacuum port (10), injecting a resin through injection port (9) and curing the (see col. 2, line 66 through col. 3, line 66 and Figures 1 and 2). Further, Alanko ('301) teaches coating the mold surface (1) with a gel coat (see col. 10, lines 30-32). Therefore, it would have been obvious for one of ordinary skill in the art to have applied a gel coat to the mold surface as taught by

Alanko ('301) in the process of Han *et al.* ('013) because such a gel coat improves weatherability and aesthetic qualities of the resulting molded product, hence providing for an improved product.

In regard to claim 9, although Han *et al.* ('013) teach both a vacuum seal/groove (41) and vacuum tape/seal (col. 6, lines 45-51) as equivalent alternatives, Han *et al.* ('013) do not teach a vacuum conduit. Alanko ('301) teach vacuum conduits (11) that communicate with the vacuum channel (8) and the plurality of dry fiber layers (4) along the periphery of the mold (see col. 2, line 66 through col. 3, line 66, col. 5, lines 36-61 and Figures 1 and 2). Therefore, it would have been obvious for one of ordinary skill in the art to have provided vacuum conduits as taught by Alanko ('301) in the process of Han *et al.* ('013) because, Alanko ('301) specifically teaches the use of vacuum conduits with a vacuum sealing arrangement, whereas Han *et al.* ('013) teaches that a vacuum tape/seal is an equivalent alternative, hence providing for improved vacuuming of the dry fiber reinforcement and as such for obtaining enhanced characteristics due to reduced porosity.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (703) 305-0396. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM and alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard D. Crispino, can be reached at (703) 308-3853. The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Stefan Staicovici, PhD



Primary Examiner

5/29/03

AU 1732

May 29, 2003